

Introduction

There are three very distinct **mechanical diseases** of the heart. Anything that causes the heart to “not work right” (cardio = heart, myo = muscle, pathy = bad or broken) is a cardiomyopathy. Whether it’s **Afib, MI, infection, toxins, autoimmune disease** – it doesn’t matter. It’s the heart’s response to these stressors that defines the cardiomyopathy. That’s our discussion.

1) Dilated Cardiomyopathy

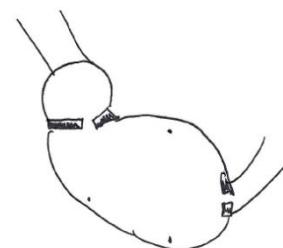
The heart works by overlying actin and myosin filaments. If they start too close together there’s nowhere for them to contract. Conversely, if they start too far apart there’s no overlap to generate contraction. When the heart **dilates** the wall gets **stretched out** (so it’s thin) and has a **decreased contractility** (producing a **systolic heart failure**). The heart becomes a bag of blood rather than a pump. The etiologies are vast: **ischemia, valve disease, idiopathic, infectious, metabolic, alcoholic, autoimmune, etc.** The point is that diagnosis and management are the same, regardless of the etiologies. A **Chest X-ray** will show an enlarged heart, while **Echo** will show the dilated ventricle. The patient will present with **heart failure symptoms** and gets **heart failure treatment**. Getting the underlying etiology is an academic exercise and beyond the scope of this course.

2) Hypertrophic Cardiomyopathy (HCM)

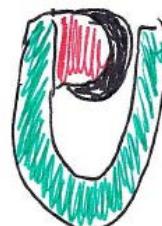
An **autosomal dominant** mutation of **myocyte sarcomeres**, this causes an asymmetric hypertrophy of the septal wall. Since it occludes the **aortic outlet** it presents just like an **aortic stenosis** except that it’s heard at the **apex** and **improves with increased preload**. Why? Because increased preload causes the ventricular chamber to fill, pushing the septum away from aortic outlet and letting blood flow. This is the opposite of aortic stenosis. Also, HCM is found in **young people** while AS is found in the elderly. Symptoms may be **SOB (most common)**, angina, or what people know it for: **sudden death in athletes**. Treat this by **avoiding dehydration** and with **β -Blockers** to allow an increase in ventricular filling.

3) Restrictive Cardiomyopathy

Heart muscle should be able to contract and relax. Dilated cardiomyopathy has trouble with contractility - getting the blood OUT (systolic failure). **Restrictive** cardiomyopathy has trouble relaxing - getting **blood in** (diastolic failure). It can’t relax to accept blood because there’s “junk in the way.” It’s caused by **Sarcoid, amyloid, hemochromatosis, cancer, and fibrosis** as well as other causes that are really rare. Treatment is tricky – it’s necessary to maintain an adequate preload while not overloading the pulmonary vasculature. **Gentle diuresis** and **heart rate control** are essential. **Transplant** in refractory cases.



Thin walls, weak contraction



The **hypertrophied septum**, growing from the **normal** **septum** overrides the **aortic opening**

By increasing preload the chamber fills, pushing the septum away from the aortic opening



All the junk in the myocardium won’t let the heart relax / fill